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FOREST INSECT SURVEY OF THE SIERRA NATIONAL

FOREST AND ADJACENT PRIVATE LANDS

SEASON OF 1950

By

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INTRODUCTION

Insects have long been active throughout most of the Sierra National Forest and the intensity of their activity has fluctuated greatly from year to year. Epidemic conditions were experienced during 1929 to 1933 whereas low endemic loss levels have generally prevailed since then.

Many complex factors have brought about this erratic behavior. Control work consisting of felling infested trees, then peeling and burning their brood-laden bark has caused sharp declines from epidemic levels of loss in various years on certain areas. Natural factors such as periods of drought or wetness, abnormally high or low winter temperatures, variation in populations of woodpeckers and predatory insects, and insect diseases have all periodically had their effect upon forest insect activity. Forest fires through their influence on tree vigor and creation of favorable breeding material have also caused loss to fluctuate in areas affected by them. Man, too, through his practice of logging timber, has influenced the amount of timber killed by insects over portions of the forest. His failure to handle logging

slash in such a manner as to cause it to be destroyed or subjected to rapid desiccation has resulted in years of severe Ips infestations.

This characteristic sharp fluctuation in forest insect activity, no matter what the cause, has concerned many throughout the past. It has become recognized that prompt detection of potentially serious outbreaks, still in their incipiency, is essential in taking prompt measures to prevent widespread epidemics. This conviction is the basis for this survey report on present infestation conditions on the forest.

Throughout the survey, the crew was greatly aided by cooperation from the forest personnel on whom they relied for overnight quarters, current road conditions and background on specific infestations where, through their daily observations additional information was available. It is hoped that future surveys will be aided again by these personnel and that when possible, district ranger staffs can spend a short period afield with the crew acquainting themselves with the work being done by them on the insect problem. Such phases as survey techniques and discussions of the characteristics and behavior of certain insects were found to have interested many during the survey.

SURVEY METHODS

During August, a survey party engaged in surveying the present status of loss on the Sierra National Forest. This was done through measurement of sample plots from which data was obtained as to the number, species and volume of trees attacked and killed as well as the species of insect which caused final death of these trees. Supplementing these plot measurements were general reconnaissances made as the crew travelled throughout the forest. These were estimates of the general

loss pattern by areas and for the forest as a whole and provided information on the extent of infestations sampled by the measured plots. In obtaining their over-all evaluation of current loss, the crew took advantage of all high points, especially Forest Service lookouts, from which views could be had of neighboring infested areas.

Because insect broods had matured and attacked additional trees since the August survey, thereby changing the infestation conditions in some areas, an aerial reconnaissance of the forest was carried out on October 31 and November 1 by various personnel of the Berkeley Forest Insect Laboratory. Those accompanying the flight on October 31 were Messrs. F. P. Keen, G. R. Struble and J. W. Bongberg who have long been acquainted with insect activity on this forest. These flights were made in order to supplement the ground measurements and observations made earlier in the season. Areas previously sampled were reappraised and several remote sectors were thoroughly viewed for the first time, due to topographic obstructions which had prevented complete observations from ground vantage points. Coming as it did, at this later time when most of the trees attacked this season had faded, the aerial reconnaissance enabled a clearer interpretation of the general loss condition over the forest. It also allowed a better estimation of the extent and intensity of current infestations in particular areas and the area of surrounding timber likely to be infested if present activity expands.

DEVELOPMENT OF INFESTATIONS AND CURRENT TRENDS

A sharp upward trend in loss began in the fall of 1949, and has continued over much of the forest this year. Areas of heavy infestation which received control action this spring included the Bass Lake,

Cascadel, Rock Creek and Chiquito units on the North Fork District, Blue Canyon and Fence Meadow (Oak Flat unit) on the Kings River District and Lewis Creek (Miami unit) on the Mariposa District.

All of these areas except Fence Meadow, were again quite heavily infested this season, as were certain areas surrounding Pilot Peak and Ferguson Ridge in the more sparse, marginal pine stands in the northwest corner of the forest. Killing in all areas has generally taken place in groups of pines rather than in scattered individual trees. These aggressive attacks give evidence of continued high loss in these areas next season.

INSECTS INVOLVED IN CURRENT KILLING

The western pine beetle, Dendroctonus brevicomis, has been responsible for the greatest amount of killing this year in ponderosa pine on all infested areas of the forest. In sugar pine, the mountain pine beetle, Dendroctonus monticolae, caused endemic loss on the Soquel, Chilcoot Creek, Sand Creek and Whiskey Ridge units, Chiquito area, and the Dinkey Mountain unit. Other insects responsible for some killing in pine were flathead borers, Melanophila spp., and the Jeffrey pine beetle, Dendroctonus jeffreyi. The latter beetle, while much less common than the western pine beetle, was encountered more extensively this year in the Chiquito area than during the past ten years. It also was present near Hoffman Meadow in the Daulton unit and in the Dinkey Mountain unit. White fir suffered considerable killing this year by the fir engraver beetle, Scolytus ventralis. Pine engraver beetles, Ips confusus, caused some top killing this year in the front ponderosa pine areas in the vicinity of logging activity, especially in the Jerseydale area. Minor infestations of Ips

also occurred on the Bass Lake and Rock Creek units.

UNITS[1/] REQUIRING SPECIAL ATTENTION

Chiquito Area:

Loss in ponderosa pine rose rapidly late in 1949 to an alarming level in some parts of the Chiquito unit (13). Killing began to appear in groups of pines in the Chiquito Creek drainage below Big Shuteye Peak, near Placer Guard Station and around Arnold and Long Meadows. The spring control work of 1950 succeeded in removing 143 of the infested trees but the incompleteness of this action is now shown by the presence of some 2000 faded trees throughout this area. They represent a loss of 1.8 million board feet of pine. In a small area at the entrance to Placer Guard Station, alone, there were 62 ponderosa pines killed by western pine beetles between the end of spring control work on May 20, 1950 and November 6, 1950, when they were felled.

Willow Creek Area:

The only units in this area which are currently extensively infested are Bass Lake (7), Cascadel (12), and Rock Creek (11), which are lower in elevation and have a higher proportion of pine on them than the other units in this area. These three units are suffering considerable current loss from groupwise and individual killing in spite of spring control work. Approximately 500 trees, mostly ponderosa pine, were killed this year on both the Bass Lake and Cascadel units. On the Rock Creek unit, a heavier infestation resulted in the killing of 1000 trees. Total loss for these three units will amount to nearly 1-1/2 million board feet.

1/ Figures in parentheses locate entomological units on the appended map.

Kings River Area:

Control work done at Oak Flat-Fence Meadow (21) this spring has effectively reduced timber loss in that vicinity. However, above normal loss is occurring in the Blue Canyon unit (19), especially surrounding Bretz Mill where aggressive group killing is evident. Fifteen hundred trees containing nearly one million board feet have been killed on this unit by bark beetles during this season. Prospects are for sustained serious loss and consequent depredation of valuable timber if present conditions continue.

Chowchilla Area:

The Jerseydale (1), Footman Ridge (2), and Miami (5) units are currently suffering considerable loss from bark beetles. An estimated 500 trees containing 400,000 board feet were killed this season in the area between Ferguson and Sweetwater Ridges on the Jerseydale unit. Loss on Footman Ridge totaled 270,000 board feet in 300 trees. Bark-beetle attacks also killed 300 trees containing 240,000 board feet in the stands around Pilot Peak on the Miami unit.

Big Creek Canyon:

This infestation lies partly in the northern Shaver Lake unit (16) but extends to the north side of Big Creek. Loss is characteristically groupwise indicating that new attacks next season will maintain the present level of draim. An estimated 500 trees containing 1/2 million board feet have been killed here this year. Areas of greatest infestation lie on the slopes to the north and south of the town of Big Creek.

RESULTS OF 1950 CONTROL WORK

The following table is a summary of control work which removed 1446 infested trees from 31,700 acres during late winter and spring of 1950[2/]. Total volume treated was 1,280,590 f.b.m. Nearly all the infested trees were ponderosa pine and the western pine beetle was the most common insect contained in them.

Project	Duration of Control Work	Area Treated (Ac.)	Number of Trees Spotted	Number of Trees Treated	Trees Treated Per Section	Total vol. Trees Treated (fbm)	Vol. Per Acre of Trees Treated (fbm)
Bass Lake	1-1-50 to 2-24-50	1200	281	281	150	66,910	56
Rock Creek	4-17-50 to 5-17-50	9700	476	440	29	399,040	41
Chiquito	4-4-50 to 5-20-50	7000	143	143	13	130,020	19
Blue Canyon	4-14-50 to 5-5-50	7300	503	429	38	277,280	38
Oak Flat-Fence Meadow	4-3-50 to 6-15-50	4000	136	126	20	368,520	92
Lewis Creek	4-23-50 to 5-9-50	2500	27	27	7	38,820	16
TOTAL		31,700	1566	1446		1,280,590	

Subsequent investigation of these areas indicates that control work has not been effective in reducing insect infestations this season, except in the Oak Flat-Fence Meadow area. Although no further control is advocated

2/ Report on control work completed during the spring of 1950, prepared by the Supervisor's Office, U.S.F.S., Sierra National Forest.

in the Oak Flat-Fence Meadow area this winter, it is essential that the other project areas be thoroughly treated to prevent continued heavy loss on them. The Lewis Creek infestation on the Miami unit (5) was light at the time of control and because of its scattered nature cannot be further reduced by control work.

CONTROL RECOMMENDATIONS

Chiquito Area:

Early heavy snows will apparently forestall fall control work in this area. As conditions improve and crews can begin operations, direct control of overwintering broods using the fell-peel-burn or spray method is recommended. The area needing treatment is extensive and particular care is needed to insure that only trees containing broods are felled and that all such trees are included in the operation in order to get the best results with the time and money available.

Control should be directed chiefly against the western pine beetle in ponderosa pine but also against the Jeffrey pine beetle in Jeffrey pine. Trees infested at their bases with flathead borers should be included in control because of the possibility of Jeffrey pine beetle infestation in their tops. Bark infested with Jeffrey pine beetles must be burned since spraying the bark with a DDT-oil solution does not kill this beetle.

Willow Creek Area:

The most heavily infested units in this area are at low elevation and should be thoroughly worked this fall and winter. This procedure will enable the control crew to concentrate all its effort on the

Chiquito area when winter conditions improve next spring and before the broods mature and begin new attacks. Two methods are possible in these units and both should be extensively used. Trees containing broods which can be salvaged at local mills will lower control costs and give the same results as peeling and burning if the provision is made for destruction of the infested slabs in the mill's trash burner. Other trees, too inaccessible to warrant salvage, will require the fell-peel-burn treatment to complete the control program.

As insurance against continued heavy killing in the highly-used Bass Lake recreational area, annual maintenance control is recommended. During the past, it has been suggested that a one half mile strip surrounding the lake shore be treated. However, infiltration into this treated area appears to have resulted in the present rather high loss and it is therefore necessary to extend the treated area to cover all infestations on surrounding slopes which are capable of renewing attacks around the lake, if not treated.

Kings River Area:

Large numbers of dead trees carrying insect broods require control action in Blue Canyon. Present centers of infestation appear capable of sustaining current loss unless insect populations can be materially reduced before the overwintering broods emerge next spring. An all out, well-planned program, including fell-peel-burn and salvage operations will be greatly effective in reducing next year's loss. All accessible currently-killed trees of merchantable size, many of which will contain overwintering broods of western pine beetles, should be salvaged by a local mill and the bark-infested slabs sent to the trash burner. In addition, the remainder of the area must be thoroughly worked, using the

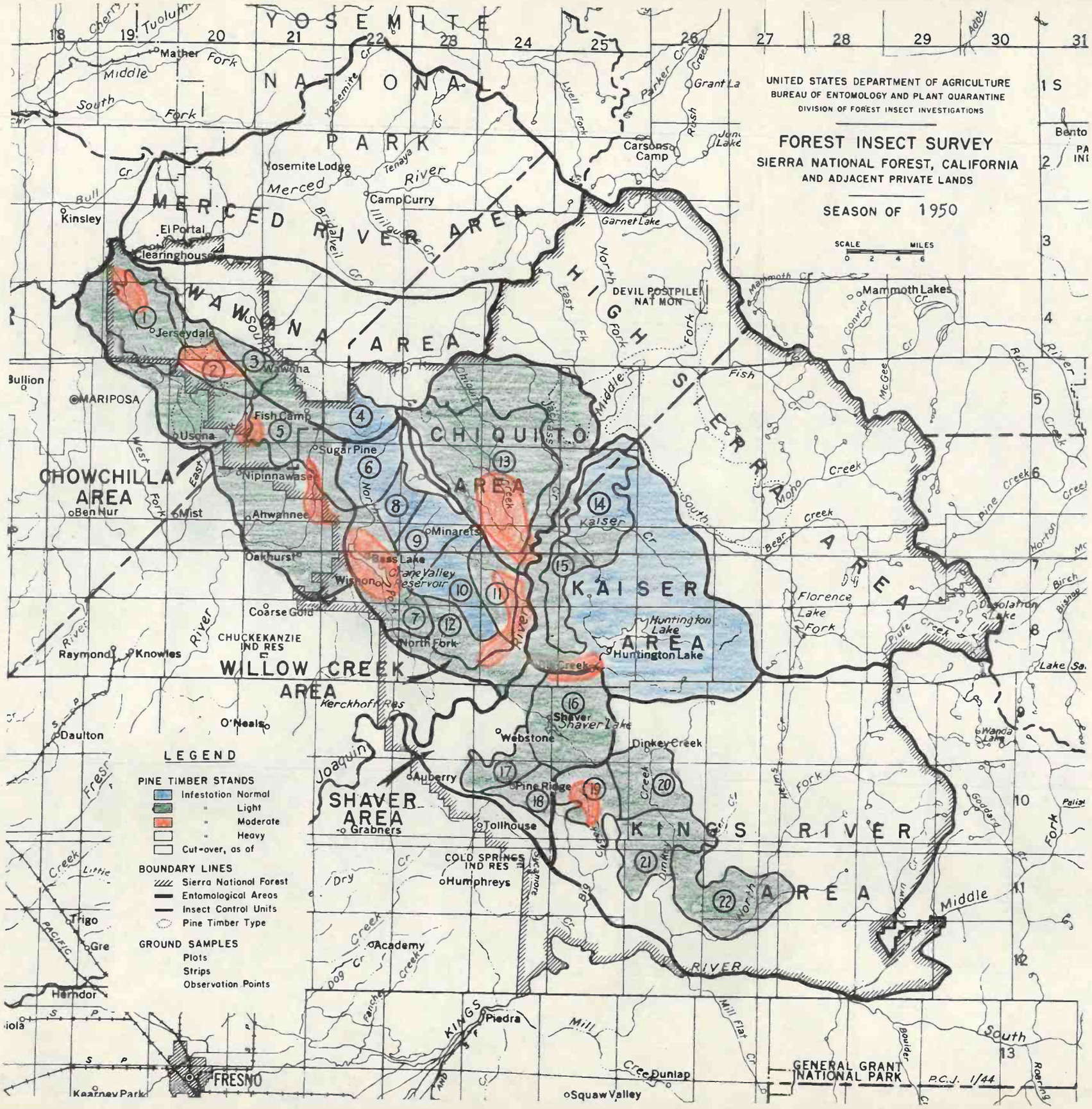
fell-peel-burn method to complete the control operation.

Chowchilla Area:

The infested timber on the Jersey dale (1), Footman Ridge (2), and Miami (5) units is partly on private land. The stands threatened are on poor sites and do not extend over large areas. Control work through use of fell-peel-burn and salvage methods is desirable but will require the full cooperation of all owners and a determination of the values threatened. If values warrant a costly control effort, all infested areas regardless of ownership, will require treatment to prevent the work accomplished from being destroyed by infiltration of insects from neighboring untreated areas.

Big Creek Canyon:

The infested pines on the slopes of Big Creek canyon in the vicinity of the town of Big Creek will require fell-peel-burn treatment. The steepness of this area and the absence of sufficient roads will preclude the salvaging of infested trees. An efficient, comprehensive control project here before overwintering broods of bark beetles abandon presently-infested trees to extend their activity over new areas, will prevent a difficult, larger control job next season.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DIVISION OF FOREST INSECT INVESTIGATIONS
FOREST INSECT SURVEY
SIERRA NATIONAL FOREST, CALIFORNIA
AND ADJACENT PRIVATE LANDS
SEASON OF 1950
SCALE MILES
0 2 4 6
YOSEMITE NATIONAL PARK
MERCED RIVER AREA
WAWONA AREA
CHIQUITO AREA
CHOWCHILLA AREA
KAISER AREA
WILLOW CREEK AREA
SHAVER AREA
KINGS RIVER AREA
HIGH SIERRA
LEGEND
PINE TIMBER STANDS
Infestation Normal
Light
Moderate
Heavy
Cut-over, as of
BOUNDARY LINES
Sierra National Forest
Entomological Areas
Insect Control Units
Pine Timber Type
GROUND SAMPLES
Plots
Strips
Observation Points
Mariposa
Jerseydale
Wawona
Fish Camp
Usona
Sugar Pine
Nipinnawasee
Ahwahnee
Oakhurst
Bass Lake
Crane Valley Reservoir
Wishon Res
Minarets
Coarse Gold
North Fork
Huntington Lake
Shaver Lake
Webstone
Dinkey Creek
Auberry
Pine Ridge
Tollhouse
Grabners
Humphreys
Academy
Piedra
Dunlap
Squaw Valley
Yosemite Lodge
Camp Curry
El Portal
Clearinghouse
Kinsley
Carsons Camp
Garnet Lake
Devil Postpile Nat Mon
Mammoth Lakes
Florence Lake
Ben Hur
Mist
Raymond
Knowles
O'Neals
Daulton
Trigo
Herndor
Kearney Park
FRESNO
Chuckekanzie Ind Res
Cold Springs Ind Res
Kerckhoff Res
General Grant National Park
P.C.J. 1/44

Unit No.	Name of Unit
1	Jerseydale
2	Footman Ridge
3	Signal Ridge
4	Fish Camp
5	Miami
6	Soquel
7	Bass Lake
8	Chilcoot Creek
9	Sand Creek
10	Whiskey Ridge
11	Rock Creek
12	Cascadel
13	Chiquito
14	Daulton
15	Canyon
16	Shaver Lake
17	Jose Basin
18	Pine Ridge
19	Blue Canyon
20	Dinkey Mtn.
21	Oak Flat
22	Patterson Mtn.

Table 2. Volume of pine timber killed in 1950 by bark beetles on the most heavily infested units.

Unit No.	Unit Name	Number of Trees Killed in 1950	Volume Per Tree (fbm)	Volume Killed in 1950 (M fbm)
1	Jerseydale	500	800	400
2	Footman Ridge	300	900	270
5	Miami	300	800	240
7	Bass Lake	500	250	125
12	Cascadel	500	900	450
11	Rock Creek	1,000	900	900
13	Chiquito	2,000	900	1,800
1/	Big Creek	500	1,000	500
19	Blue Canyon	1,500	650	975
TOTAL		7,100		5,660

1/ Partly in Shaver Unit (16)